REMARKS

Claims 1, 3, 6-8, 10 and 13-14 are pending in this application. Base claims 1, 6 and 13 are believed to be distinguishable over the cited prior art. As a result, no claim has been amended herein.

The Examiner's several courtesies extended to Applicants' representative during an in-person Office Interview conducted on February 26, 2008, are noted with appreciation. During the interview, the Examiner recommends filing a CFR 1.132 affidavit showing unexpected results for the claim range of grain size compared to the prior art disclosures in order to overcome the outstanding rejections of claims 1, 3 and 13-14 under 35 U.S.C. §102(b) as being anticipated by Jung, U.S. Patent No. 6,825,493, or in the alternative, under 35 U.S.C. §103(a) as being unpatentable over the same Jung, U.S. Patent No. 6,825,493 for reasons stated on pages 2-4 of the final Office Action.

In response thereto, a Declaration under 37 CFR §1.132 is enclosed to demonstrate UNEXPECTED RESULTS when Applicants' claimed "width of the overlapping region during crystallization corresponds to the distance, and is varied from no less than 0.5 μm to 2 μm," and "the average width of the polycrystalline silicon grains is varied between approximately 0.2 μm and 0.6 μm, and "is decreased when the width of the overlapping region on which the laser beam is overlappingly irradiated is decreased" as defined in base claims 1 and 13.

Specifically, the inventor, Mr. Hye-Hyang Park, declares that:

1. Jung '493 discloses a conventional sequential lateral solidification (SLC) crystallization method in which a single mask is used to fabricate both switching circuits, such as, TFTs, and driving circuits, such as, CMOS devices, in order to reduce the process time and to improve production. Such a mask 130 is shown in FIG. 5, including light transmitting portions 132 and light absorptive portions 134. Each light transmitting portion 132 has a width of 2 micrometers (μm). Each light absorptive portion 134 has a width of 10 micrometers (μm). Such a mask 130 is used differently depending upon whether the crystallization process is utilized for the driving circuits, i.e., CMOS devices, as shown in FIGs. 6A-6D, or alternatively, for the switching circuits, i.e., TFTs, as shown in FIGs. 7A-7D. For example, in the embodiment shown in FIGs. 6A-6D, the mask 130 is used to move along the lateral grain growth of the grains (see FIG. 6A) in a X-direction by a distance of about 0.7 micrometers (see column 9, lines 54-55 of Jung '493) during the fabrication of the driving

circuits, i.e., CMOS devices. As a result, the polycrystalline silicon grains are obtained with a width "P" of 12 micrometers (see column 10, lines 8-10 of Jung '493). In a separate embodiment shown in FIGs. 7A-7D, the mask 130 is used to move in a X-direction by a distance of about 1.7 micrometers (see column 10, lines 40-41 of Jung '493) during the fabrication of the switching circuits, i.e., TFTs. As a result, the resulting grains are obtained with a width of 1.7 micrometers (see column 10, lines 64-65 of Jung '493). According to Jung '493, each grain has a width of about 1.7 micrometers (μm) (see column 10, lines 64-65 of Jung '493), which is sufficient for the active layers of the TFTs (see column 11, lines 2-5 of Jung '493).

2. According to Jung '493, the smallest width for the polycrystalline silicon grains can be obtained is 1.7 micrometers (μm), which is entirely consistent with what was disclosed in the Background of the instant application. In other words, if the width of the polycrystalline silicon grains is made smaller than the conventional width of 1.7 micrometers (μm) as disclosed in Jung '493, then the mobility of an electric field is greatly deteriorated by a scattering effect during charge transfer; see paragraph [0009] of Applicants' disclosure.

3. Jung '493 does not disclose each of the recited features of a "width of the overlapping region during crystallization corresponds to the distance, and is varied from no less than 0.5 μm to 2 μm," and "the average width of the polycrystalline silicon grains is varied between approximately 0.2 μm and 0.6 μm, and is decreased when the width of the overlapping region on which the laser beam is overlappingly irradiated is decreased," as recited by Applicants' independent claims 1 and 13.

4. More importantly, the grains illustrated in FIG. 3C of Jung '493 are not illustrated or described as having an average width which is "varied between approximately 0.2 μm and 0.6 μm," as recited by Applicants' independent claims 1 and 13. Moreover, FIG. 3C of Jung '493 does not show silicon grains having a width approximately within the claimed range based on the 0.7 micrometer scale. Rather, as described on column 3, lines 49-61 of Jung '493, FIG. 3C is an enlarged view of how a mask translates across the sample substrate by a distance of 0.7 micrometers in a transverse direction (i.e., in the x-axial direction). According to Jung '493, when the same mask moves by 0.7 micrometers, the average width of the grains becomes 12 micrometers (see column 10, lines 8-10 of Jung '493) in the driving circuit (CMOS) area, and 1.7 micrometers (see column 10, lines 64-65 of Jung '493) in the switching circuit (TFT) area.

In other words, FIG. 3C of Jung '493, as relied upon by the Examiner, FIG. 3C of Jung '493, as described on column 3, lines 49-61 of Jung '493, is an enlarged view of how a mask translates across the sample substrate by a distance of 0.7 micrometers in a transverse direction

(i.e., in the x-axial direction). The scale of 0.7 micrometers does not represent the length of the grain upon which the width could be assumed as being smaller than 0.7 micrometers. According to Jung '493, when the same mask moves by 0.7 micrometers, the average width of the grains becomes 12 micrometers (see column 10, lines 8-10 of Jung '493) in the driving circuit (CMOS) area, and 1.7 micrometers (see column 10, lines 64-65 of Jung '493) in the switching circuit (TFT) area.

In view of these reasons and the Declaration under Rule 312, as enclosed with Exhibit A (earlier publication of Applicants' disclosed invention) to show UNEXPECTED RESULTS, Applicants respectfully request that the rejection of claims 1, 3 and 13-14 be withdrawn.

Turning now to the rejection of claims 6-10 under 35 U.S.C. §103 as being unpatentable over Jung, U.S. Patent No. 6,825,493 and further in view of Yang, U.S. Publication No. 2002/0197759 for reasons stated on pages 4-6 the final Office Action. Again, in view of the Declaration under 37 CFR §1.132, and in view of the fact that neither Jung '493 nor Yang, U.S. Patent Application Publication No. 2002/0197759, as a secondary reference, discloses or suggests what the Examiner alleges, that is, the use of a mask provided with at least a light transmission region for passing a laser beam and a laser non-transmission region for blocking the laser beam, wherein the laser transmission region is wider than the laser non-transmission region by more than 1 μm, which is particularly important to achieve the "width of the overlapping region during crystallization ... is varied from no less than 0.5 μm and 2 μm" as defined in base claim 6, Applicants respectfully request that the rejection of claims 6-10 be withdrawn.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC office at (202) 216-9505. Applicants respectfully reserve all rights to file subsequent related application(s) (including reissue applications) directed to any or all previously claimed limitations/features which have been amended or canceled, or to any or all limitations/features not yet claimed, i.e., Applicants have no intention or desire to dedicate or surrender any limitations/features of the disclosed invention to the public.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Stein, McEwen & Bui, LLP, No. 503333, and credit any excess fees to said deposit account.

Respectfully submitted,

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